REMARKS:

In response to the objection to the Abstract, the original Abstract is replaced by a shortened version thereof.

Claim 4 is canceled in response to the objection thereto under 37 CFR 1.75(c).

Claims 1 and 16 are amended in response to the objection that originally filed claims 1 and 16 are informal.

Claims 1-143 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite on the ground that "the claim(s) include(s) elements not actually disclosed (those encompassed by 'TMDS-like communication link')." In response to the rejection, each uncanceled one of the independent claims, and claims 53 and 86, are amended to include a definition of "TMDS."

The phrases "TMDS-like communication link" and "TMDS-like link" are used synonymously in the claims. Many of the independent claims do not recite a "TMDS-like communication link," but instead recite a "TMDS-like link." Applicants respectfully contend that each uncanceled one of claims 1-143, as amended, satisfies the requirements of 35 U.S.C. 112, second paragraph, for the following reasons.

At page 6, lines 27-32, the specification of the present application defines the phrase "TMDS-like link" by explaining that "TMDS-like link" denotes:

> a serial link, capable of transmitting digital video data (and a clock for the digital video data) from a transmitter to a receiver ... that is or includes either a TMDS link or a link having some but not all of the characteristics of a TMDS link.

According to this definition a TMDS link is an example of a TMDS-like link. A TMDS link (e.g., the TMDS link of Fig. 1) is designed to be connected between a transmitter (e.g., transmitter 1 of Fig. 1) and a receiver (e.g., receiver 3 of Fig. 1), and includes four conductor pairs (as well as additional conductors): three conductor pairs that implement video channels ("Channel 0," "Channel 1," and "Channel 2" of Fig. 1); and a fourth conductor pair that implements a clock channel ("Channel C" of Fig. 1). Encoded video data and a video

clock signal are transmitted as differential signals over these conductor pairs, with signal transmission over the conductor pairs typically occurring in one direction only from a transmitter to a receiver. Other examples of TMDS-like links that are not TMDS links are described in the present application's specification. Although different TMDS-like links may have different numbers of conductors, may transmit digital video data in different formats (e.g., unencoded digital video, or digital video encoded in any of a variety of different ways), and may transmit data other than digital video data (as well as digital video data and a clock for digital video data), the definition of "TMDS-like link" is believed to be unambiguous.

Applicants do not intend that any of claims 1-3 and 5-143, as amended, must include any element in addition to the elements explicitly recited therein. The recited expressions "TMDS-like link" and "TMDS-like communication link" are used synonymously and are defined unambiguously in the specification at page 6, lines 27-32. Thus, Applicants contend that the claims are unambiguous and satisfy the requirements of 35 U.S.C. 112.

Neither the MPEP section cited in support of the rejection (MPEP Section 2173.05(d)) nor any statute or regulation prohibits use of phrases in claims whose meaning is clear from supporting description in the specification. Because the synonymous expressions "TMDS-like link" and "TMDS-like communication link" are defined unambiguously in the specification, they are used properly in the claims.

Applicants respectfully request that the Examiner identify any element that the Examiner contends is necessarily included in any of the claims as amended (but not recited in such claim) unless the rejection under 35 U.S.C. 112, second paragraph, is withdrawn.

Claim 60 stands rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,141,693 ("Perlman"). In response, Applicants contend that claim 60 is patentable over the cited reference for the following reasons.

Claim 60 recites a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the link comprises at least one digital video channel (e.g., Channel 0 of Fig. 1) and at least one analog video channel (e.g., the lines

labeled "Analog" in Fig. 1), the transmitter is configured to transmit digital video data to the receiver over the digital video channel, and at least one of the transmitter and the receiver is configured to operate in a mode in which it transmits auxiliary data to the other of the transmitter and the receiver over the analog video channel.

Perlman teaches (at col. 6, line 43- col. 7, line 15) that the link between source 501 and server 505 can be either a digital link for sending video stream 503 (which includes auxiliary data) as digitized data, or an analog link for sending video stream 503 as an analog signal. Perlman does not specify what type of link is employed between server 505 and client 510. There is no teaching or suggestion determinable from Perlman to employ a link having at least one digital video channel and at least one analog video channel as recited in claim 60. Perlman also fails to teach or suggest a transmitter configured to transmit digital video data to a receiver over the digital video channel of a link (having at least one digital video channel and at least one analog video channel) where at least one of the transmitter and receiver is configured to operate in a mode in which it transmits auxiliary data to the other of the transmitter and the receiver over the analog video channel of the link.

Apparently, claims 60 and 61 stand rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application 2002/0019984 ("Rakib"). In response, Applicants contend that these claims are patentable over the cited reference for the following reasons.

Claim 60 recites a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the link comprises at least one digital video channel (e.g., Channel 0 of Fig. 1) and at least one analog video channel (e.g., the lines labeled "Analog" in Fig. 1), the transmitter is configured to transmit digital video data to the receiver over the digital video channel, and at least one of the transmitter and the receiver is configured to operate in a mode in which it transmits auxiliary data to the other of the transmitter and the receiver over the analog video channel.

Rakib teaches (in paragraphs 0057 and 0080) that element 132 is a PSTN subscriber loop over which packetized commands can be sent from gateway 102 to internet server 134 and program guide data can be sent from internet server 134 to gateway 102. Gateway 102

receives video data at gateway 102's digital TV satellite receiver 106. There is no teaching or suggestion determinable from Rakib that subscriber loop 132 has at least one digital video channel and at least one analog video channel as recited in claim 60, or to employ any link having at least one digital video channel and at least one analog video channel (as recited in claim 60) between gateway 102 and any other element. Rakib also fails to teach or suggest a transmitter configured to transmit digital video data to a receiver over the digital video channel of a link (having at least one digital video channel and at least one analog video channel) where at least one of the transmitter and receiver is configured to operate in a mode in which it transmits auxiliary data to the other of the transmitter and the receiver over the analog video channel of the link.

Rakib also fails to teach or suggest a transmitter configured to operate in a mode in which it transmits audio data to a receiver over an analog video channel (of a link comprising at least one digital video channel and at least one analog video channel) while transmitting digital video data to the receiver over a digital video channel of the link (as recited in claim 61). Contrary to the Examiner's suggestion, both video signal 126 and audio signal 127 output from decompression and digital to analog conversion circuit 110 are analog signals for display and playback by television 128 (referred to as television "82" in paragraph 0057).

Claims 36, 43, 46, 48, 68, 69, 74-76, 79, 89-92, 95, 99, and 101, and apparently also claim 57, stand rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 5,557,278 ("Piccirillo"). In response, Applicants contend that these claims are patentable over the cited reference for the following reasons.

Claim 36 recites a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the transmitter is configured to transmit video data over the link to the receiver, the link includes at least one multi-purpose line, the transmitter and the receiver are operable in a first mode in which one of the transmitter and the receiver transmits a first signal indicative of auxiliary data over the at least one multi-purpose line to the other one of the transmitter and the receiver, and the transmitter and the receiver are operable in a second mode in which one of the transmitter and the receiver

transmits a second signal over the at least one multi-purpose line to the other one of the transmitter and the receiver.

Piccirillo describes (with reference to Fig. 1) a system including hazard response apparatus ("AIHR") 10, control unit 16, work stations 20a-20c, radar transceivers 18a and 18b, and processors 23a-23c. However, there is no teaching or suggestion determinable from Piccirillo (at col. 4, line 46 – col. 5, line 21, or elsewhere) that any line between any two of these elements is a "multi-purpose" line as recited in claim 36. Nor is there any teaching or suggestion determinable from Piccirillo that any two of the noted elements are a transmitter and receiver operable in a first mode in which one of them sends a first signal indicative of auxiliary data over at least one multi-purpose line to the other one and in a second mode in which one of them transmits a second signal over the at least one multi-purpose line to the other one, as recited in claim 36.

Claim 43 recites a communication system, including a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the transmitter is configured to transmit video data over a video channel of the link to the receiver, wherein the link includes an additional channel for bidirectional communication between the transmitter and at least one of the receiver and a device associated with the receiver, and wherein at least one of the transmitter and the receiver is operable in a mode in which it transmits auxiliary data over the additional channel to the other one of the transmitter and the receiver. There is no teaching or suggestion determinable from Piccirillo (at col. 4, line 46 – col. 5, line 21, or elsewhere) that any link between any two of the above-noted elements of Piccirillo includes both a video channel and an "additional channel for bidirectional communication" as recited in claim 43, or that any of the above-noted elements of Piccirillo transmits auxiliary data over an "additional channel for bidirectional communication" (of a link that also includes a video channel) as recited in claim 43.

Claim 46 (which depends from claim 43) recites that the auxiliary data are audio data. In support of the rejection of claim 46, the Office Action cites Piccirillo's teaching at col. 4, line 18, that an airport hazard avoidance manager can cause an audio/visual alarm to be created in response to identifying an "alert condition" at an airport. Neither this teaching, nor

other teaching in Piccirillo (e.g., Piccirillo's teaching at col. 5, lines 16-21, that AIHR 10 can "provide" audible signals) amounts to a teaching or suggestion of the noted limitations of claim 43, or a teaching or suggestion to transmit audio data over an "additional channel for bidirectional communication" of a link that also includes a video channel as in claim 46.

Claim 48 recites a communication system, including a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the link comprises at least two video channels, the transmitter is operable in a first mode in which it transmits video data to the receiver over a first subset of the video channels but not a second subset of the video channels, the transmitter is operable in another mode in which it transmits video data to the receiver over all of the video channels, and the transmitter is configured to transmit auxiliary data to the receiver over the second subset of the video channels during the first mode.

There is no teaching or suggestion determinable from Piccirillo (at col. 4, line 46 – col. 5, line 21, or elsewhere) that any link between any two of the above-noted elements of Piccirillo includes at least two video channels as recited in claim 48, or that any of the above-noted elements of Piccirillo is operable in the modes recited in claim 48. The Office Action does not identify any link between elements of Piccirillo's system that includes at least two video channels, or any element of Piccirillo's system that is operable in the modes recited in claim 48.

Claim 57 recites a communication system, including a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the link comprises at least one video channel, the transmitter is configured to transmit video data and auxiliary data to the receiver over the video channel, the video data are determined by a first set of code words, the auxiliary data are determined by a second set of code words, and none of the code words in the second set is a member of the first set.

There is no teaching or suggestion determinable from Piccirillo (at col. 4, line 46 – col. 5, line 21, or elsewhere) to transmit video data and auxiliary data over a video channel of

a link using first and second sets of code words as recited in claim 57. The Office Action does not identify any such teaching or suggestion in Piccirillo.

Claim 68 recites a communication system, including a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the link has multiple data transmission channels, the transmitter is configured to transmit video data to the receiver over at least a first channel of the link, and at least one of the transmitter and the receiver is configured to transmit a first stream of auxiliary data over a second channel of the link to the other one of the transmitter and the receiver, and at least one of the transmitter and the receiver is configured to transmit a second stream of auxiliary data over one of the first channel of the link and a third channel of the link to the other one of the transmitter and the receiver. There is no teaching or suggestion determinable from Piccirillo (at col. 4, line 46 – col. 5, line 21, or elsewhere) to transmit video data over a first channel of a link (having multiple channels), a first stream of auxiliary data over a second channel of the link, and a second stream of auxiliary data over one of the first channel and a third channel of the link, as recited in claim 68. The Office Action does not identify any such teaching or suggestion.

Claim 69 (which depends from claim 68) recites that the auxiliary data are audio data. In support of the rejection of claim 69, the Office Action cites Piccirillo's teaching at col. 4, line 18, that an airport hazard avoidance manager can cause an audio/visual alarm to be created in response to identifying an "alert condition" at an airport. Neither this teaching, nor other teaching in Piccirillo (e.g., Piccirillo's teaching at col. 5, lines 16-21, that AIHR 10 can "provide" audible signals) amounts to a teaching or suggestion of the noted limitations of claim 68, or a teaching or suggestion to transmit video data over a first channel of a link (having multiple channels), a first stream of audio data over a second channel of the link, and a second stream of audio data over one of the first channel and a third channel of the link, as in claim 69.

Applicants cannot identify any teaching or suggestion in Piccirillo of any of the additional limitations (not recited in claim 68) of dependent claim 74, 75, 76, or 79. Applicants request that the Examiner identify any teaching in Piccirillo that the Examiner

contends to be a teaching or suggestion of such additional limitations unless the rejection is withdrawn.

Claim 89 recites a communication system, including a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the link has multiple data transmission channels, the transmitter is configured to transmit video data to the receiver over at least a first channel of the link, and at least one of the transmitter and the receiver is configured to transmit a portion of a stream of auxiliary data over a second channel of the link to the other one of the transmitter and the receiver, and at least one of the transmitter and the receiver is configured to transmit another portion of the stream of auxiliary data over one of the first channel of the link and a third channel of the link to the other one of the transmitter and the receiver. There is no teaching or suggestion determinable from Piccirillo (at col. 4, line 46 – col. 5, line 21, or elsewhere) to transmit video data over a first channel of a link (having multiple channels), a portion of a stream of auxiliary data over a second channel of the link, and another portion of the stream of auxiliary data over one of the first channel and a third channel of the link, as recited in claim 89. The Office Action does not identify any such teaching or suggestion.

Claim 90 (which depends from claim 89) recites that the auxiliary data are audio data. In support of the rejection of claim 90, the Office Action cites Piccirillo's teaching at col. 4, line 18, that an airport hazard avoidance manager can cause an audio/visual alarm to be created in response to identifying an "alert condition" at an airport. Neither this teaching, nor other teaching in Piccirillo (e.g., Piccirillo's teaching at col. 5, lines 16-21, that AIHR 10 can "provide" audible signals) amounts to a teaching or suggestion of the noted limitations of claim 89, or a teaching or suggestion to transmit video data over a first channel of a link (having multiple channels), a portion of a stream of audio data over a second channel of the link, and another portion of the stream of audio data over one of the first channel and a third channel of the link, as in claim 90.

Claim 91 recites a communication system, including a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the link has multiple data transmission channels, the transmitter is configured to transmit video data

to the receiver over at least a first channel of the link, the transmitter and the receiver are configured to operate in a first mode in which the transmitter transmits a signal indicative of auxiliary data over a second channel of the link to the receiver, and the transmitter and the receiver are configured to operate in a second mode in which the receiver asserts a second signal over the second channel to the transmitter. There is no teaching or suggestion determinable from Piccirillo (at col. 4, line 46 – col. 5, line 21, or elsewhere) to transmit video data over a first channel of a link (having multiple channels), to transmit auxiliary data over a second channel of the link to a receiver, and to transmit a second signal over the second channel to a transmitter, as recited in claim 91. The Office Action does not identify any such teaching or suggestion.

Claim 92 (which depends from claim 91) recites that the auxiliary data are audio data. In support of the rejection of claim 92, the Office Action cites Piccirillo's teaching at col. 4, line 18, that an airport hazard avoidance manager can cause an audio/visual alarm to be created in response to identifying an "alert condition" at an airport. Neither this teaching, nor other teaching in Piccirillo (e.g., Piccirillo's teaching at col. 5, lines 16-21, that AIHR 10 can "provide" audible signals) amounts to a teaching or suggestion of the noted limitations of claim 91, or a teaching or suggestion to transmit video data over a first channel of a link (having multiple channels), to transmit audio data over a second channel of the link to a receiver, and to transmit a second signal over the second channel to a transmitter, as in claim 91.

Claim 95 recites a communication system, including a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the link has multiple data transmission channels, the transmitter is configured to transmit video data to the receiver over at least a first channel of the link, the transmitter and the receiver are configured to operate in a first mode in which one of the transmitter and the receiver asserts a signal indicative of auxiliary data over a second channel of the link to the other one of the transmitter and the receiver, and the transmitter and the receiver are configured to operate in a second mode in which said one of the transmitter and the receiver asserts a second signal over the second channel to the other one of the transmitter and the receiver. There is no teaching or suggestion determinable from Piccirillo (at col. 4, line 46 – col. 5, line 21, or elsewhere) to

transmit video data over a first channel of a link (having multiple channels), to assert a signal indicative of auxiliary data over a second channel of the link to one of a transmitter and a receiver, and to transmit a second signal over the second channel to said one of the transmitter and the receiver, as recited in claim 95. The Office Action does not identify any such teaching or suggestion.

Claim 99 recites a receiver, including an input for receiving auxiliary data, a video input configured to be coupled to a video channel of a TMDS-like link, an output configured to be coupled to another channel of the link, and circuitry (coupled to the output) configured to operate in a first mode in which it asserts a signal indicative of the auxiliary data to the output and to operate in a second mode in which it asserts to the output a signal indicative of presence of a device coupled to the receiver. There is no teaching or suggestion determinable from Piccirillo (at col. 4, line 46 – col. 5, line 21, or elsewhere) of a receiver having the elements recited in claim 99. Although the Office Action apparently contends that Piccirillo's radar terminal system (ARTS) 14 is an input of a receiver, ARTS 14 is not an element of any receiver and instead is a source of a data signal 33 that is asserted to hazard response apparatus ("AIHR") 10. Although the Office Action apparently contends that Piccirillo's AIHR 10 is an output of a receiver that has ARTS 14 as an input, Applicants are unable to identify in Piccirillo any receiver having ARTS 14 as an input and AIHR 10 as an output. The Office Action does not identify any teaching or suggestion in Piccirillo of "circuitry" configured to operate in a first mode and a second mode as recited in claim 99, and Applicants are unable to identify such teaching or suggestion in Piccirillo (at col. 4, line 46 – col. 5, line 21, or elsewhere).

Claim 101 recites a communication system, including a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the link has multiple data transmission channels, the transmitter is configured to transmit video data to the receiver over at least a first channel of the link, and at least one of the transmitter and the receiver is configured to transmit auxiliary data over a second channel of the link, to the other one of the transmitter and the receiver, while at least one of the transmitter and the receiver asserts a signal over the second channel. There is no teaching or suggestion determinable from Piccirillo (at col. 4, line 46 – col. 5, line 21, or elsewhere) of a system

having the elements recited in claim 101. The Office Action does not identify any teaching or suggestion in Piccirillo of either a transmitter or receiver configured to transmit auxiliary data over a second channel of a TMDS-like link to the other one of the transmitter and the receiver, while at least one of the transmitter and the receiver asserts a signal over the second channel, and Applicants are unable to identify such teaching or suggestion.

Claims 1-6, 8, 15-19, 21, 31, 47, 52, 56-57, 59, 99, 112, 125, and 130, and apparently also claim 10, stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.K. Application GB 2174577A ("Hentschke"). In response, Applicants contend that the uncanceled ones of these claims are patentable over the cited reference for the following reasons.

Claim 1 recites a communication system, including a transmitter, a receiver, and a TMDS-like communication link between the transmitter and the receiver, wherein the transmitter is configured to transmit video data over the link to the receiver, and the transmitter is configured to transmit auxiliary data to the receiver by modulating DC disparity of a channel of the communication link.

Hentschke teaches use of code words having zero DC disparity (e.g., 6-bit code words in "Example 1" and "Example 2," each consisting of three zeros and three ones) to transmit both "main" data (e.g., three-bit words $a_1a_2a_3$ in "Example 1" and "Example 2") and auxiliary data (e.g., three-bit words $c_1c_2c_3$ in "Example 1" and "Example 2"). Thus, a sequence of Hentschke's code words necessarily has zero DC disparity.

Hentschke teaches that the code words should have zero DC disparity not only so that the code is a "direct-current-free code" but also to simplify block synchronization in the receive-side block decoder. Thus, Hentschke teaches away from transmission of a sequence of code words having non-zero DC disparity, and Hentschke teaches away from modulating DC disparity to transmit auxiliary data as claimed. Hentschke not only fails to teach or suggest a transmitter is configured to transmit auxiliary data to a receiver by modulating DC disparity of a channel of a communication link as claimed, but Hentschke teaches away from the claimed invention.

Claim 3 is also patentable over Hentschke because Hentschke fails to teach or suggest a receiver configured to determine a sequence of differences between successive values of accumulated DC disparity (of a transmitted stream of code words), thereby determining auxiliary data. Hentschke teaches transmission of a stream of code words having zero DC disparity; not transmission of a stream of code words having nonzero DC disparity. Thus, the accumulated DC disparity of Hentschke's transmitted code word stream is always zero.

Claim 5 is also patentable over Hentschke because Hentschke fails to teach or suggest transmission of a stream of code words having a sequence of instantaneous values of DC disparity that determines auxiliary data. The instantaneous DC disparity (after transmission of each code word) of Hentschke's transmitted code word stream is always zero.

Claim 6 is also patentable over Hentschke because Hentschke fails to teach or suggest transmission of a stream of code words having a sequence of instantaneous values of DC disparity, where a sequence of differences between successive values of the DC disparity determines auxiliary data. The instantaneous DC disparity (after transmission of each code word) of Hentschke's transmitted code word stream is always zero.

Claim 10 recites a communication system, including a transmitter, a receiver, and a TMDS-like communication link between the transmitter and the receiver, wherein at least one of the transmitter and the receiver is configured to transmit a stream of data words determining auxiliary data over the link to the other one of the transmitter and the receiver, a data structure of each of at least a subset of the words is indicative of DC disparity, and the auxiliary data are determined by one of a sequence of values of the DC disparity and a sequence of differences between successive ones of the values of the DC disparity.

Claim 10 is patentable over Hentschke because Hentschke fails to teach or suggest transmission of a stream of code words determining auxiliary data, where a data structure of each of at least a subset of the words is indicative of DC disparity and the auxiliary data are determined by one of a sequence of values of the DC disparity and a sequence of differences between successive ones of the values of the DC disparity. As noted, Hentschke teaches use

of code words having zero DC disparity to transmit both "main" data (e.g., three-bit words $a_1a_2a_3$ in "Example 1" and "Example 2") and auxiliary data (e.g., three-bit words $c_1c_2c_3$ in "Example 1" and "Example 2"). Thus, a sequence of Hentschke's code words necessarily has zero DC disparity. Hentschke teaches that the code words should have zero DC disparity not only so that the code is a "direct-current-free code" but also to simplify block synchronization in the receive-side block decoder. Thus, Hentschke teaches away from transmitting a sequence of code words having non-zero DC disparity, teaches away from modulating DC disparity to transmit auxiliary data, and teaches away from the claimed invention.

Claim 15 is a method for sending data over a TMDS-like communication link, comprising the step of transmitting a stream of data words over at least one channel of the link thereby modulating DC disparity of the channel, such that the DC disparity is indicative of auxiliary data. Claim 18 is directed to a transmitter configured to generate an output signal (for transmission over a channel of a link) that modulates DC disparity of the channel and is indicative of auxiliary data. Claim 15 and 18 are patentable over Hentschke because Hentschke fails to teach or suggest any method with either of these limitations. As noted, Hentschke teaches use of code words having zero DC disparity to transmit both "main" data (e.g., three-bit words $a_1a_2a_3$ in "Example 1" and "Example 2") and auxiliary data (e.g., three-bit words $c_1c_2c_3$ in "Example 1" and "Example 2"). A sequence of Hentschke's code words necessarily has zero DC disparity. As explained above, Hentschke teaches away from transmitting a sequence of code words having non-zero DC disparity or modulating DC disparity to transmit auxiliary data, and thus teaches away from the invention of claims 15 and 18.

Claim 31 recites a communication system, including a transmitter, a receiver, and a TMDS-like communication link between the transmitter and the receiver, wherein the transmitter is configured to transmit video data over the link to the receiver "as a stream of binary data words that determine an analog auxiliary signal as well as the video data." An example of the noted transmission of binary data words is set forth in the specification at page 50, where it is explained how analog audio signals (or other analog auxiliary signals) can be transmitted in accordance with the invention in DC disparity channels of a TMDS-like link: "In each DC disparity channel, as the accumulated DC disparity changes, the maximum

allowed DC disparity value (beyond which the DC disparity channel cannot be used) can be dynamically changed, so that the envelope of the DC disparity wander can itself be considered an analog signal indicative of the auxiliary information to be transmitted (e.g., an analog audio signal which can be amplified at the receiver side and then used to drive a loudspeaker)."

Hentschke fails to teach or suggest transmission of a stream of binary data words that determine an analog auxiliary signal and as well as video data, as recited in claim 31. There is no teaching or suggestion determinable from Hentschke of a transmitter configured to transmit a stream of binary data words that determine video data and an analog auxiliary signal, as expressly recited in claim 31. The Office Action does not identify any element of Hentschke's system that is configured as recited in claim 31. Thus, claim 31 is patentable over Hentschke.

Claim 47 recites a transmitter for use in data transmission over a TMDS-like link having a first channel (for communication between the transmitter and at least one of a receiver and a device associated with the receiver, said communication including transmission of device identification data) and at least one video channel. The transmitter includes a first output configured to be coupled to the video channel, a second output configured to be coupled to the first channel, and circuitry configured to generate a video signal and assert the video signal to the first output for transmission over the video channel, and to generate a second output signal indicative of the auxiliary data and assert the second output signal to the second output for transmission over the first channel. The circuitry is also configured to recover any of the device identification data received at said second output.

Claim 47 is patentable over Hentschke because Hentschke fails to teach or suggest a TMDS-like link having a first channel (for communication between a transmitter and at least one of a receiver and a device associated with the receiver, said communication including transmission of device identification data) and at least one video channel. Contrary to the assertion in the Office Action, the only link between Hentschke's transmitter (comprising elements 1, 2, and 3) and another device is link 4, which is an unspecified "optical transmission circuit" not described as including both a first channel and a video channel as

claimed. Data streams "D" and "H" are the input data to the transmitter, which are to be encoded and then transmitted over link 4. Hentschke does not teach or suggest a transmitter including both a first output configured to be coupled to a video channel, and a second output configured to be coupled to a first channel as claimed. Further, Hentschke does not teach or suggest a transmitter including circuitry configured to a assert a video signal to a first output for transmission over a video channel of a link, and to assert a second output signal indicative of auxiliary data to a second output for transmission over a first channel of the link. Absent such teaching or suggestion determinable from Hentschke (or other art of record), Applicants respectfully contend that it is improper to reject claim 47 on the basis of an unsupported assertion that "it would have been obvious to one of ordinary skill in the art" to modify Hentschke's teaching to reach the claimed invention.

Claim 52 is canceled. Claim 53 is rewritten in independent form and amended to include a definition of "TMDS." As amended, claim 53 is believed to be in condition for allowance in view of the reference thereto in paragraph 23 of the Office Action.

Claims 57, 59, 125, and 130 are directed to a transmitter is configured to transmit video data and auxiliary data to the receiver over a channel (e.g., a video channel) a TMDS-like communication link, where the video data are determined by a first set of code words, the auxiliary data are determined by a second set of code words, and none of the code words in the second set is a member of the first set, and to a communication system including such a transmitter. Claims 57, 59, 125, and 130 are patentable over Hentschke because Hentschke fails to teach or suggest (at the cited abstract and page 1, lines 16-52, or elsewhere) either a transmitter configured to transmit video data and auxiliary data over a video channel (or other channel) of a communication link, or a transmitter configured to transmit video data (determined by a first set of code words) and auxiliary data (determined by a second set of code words) over a video channel (or other channel) of a communication link, where none of the code words in the second set is a member of the first set. Hentschke teaches away from the claimed invention by teaching use of a single set of code words to transmit both "main data" and auxiliary data, with some bits of each code word being indicative of main data and the other bits of each code word being indicative of auxiliary data.

Claim 99 recites a receiver, including an input for receiving auxiliary data, a video input configured to be coupled to a video channel of a TMDS-like link, an output configured to be coupled to another channel of the link, and circuitry (coupled to the output) configured to operate in a first mode in which it asserts a signal indicative of the auxiliary data to the output and to operate in a second mode in which it asserts to the output a signal indicative of presence of a device coupled to the receiver. There is no teaching or suggestion determinable from Hentschke (at page 1, line 16 – 52, or elsewhere) of a receiver having the elements recited in claim 99. For example, Hentschke fails to teach or suggest that the receiver comprising elements 5, 6, and 7 (or any other receiver) should operate in two modes of the type recited in claim 99. Absent such teaching or suggestion determinable from Hentschke (or other art of record), Applicants respectfully contend that it is improper to reject claim 99 on the basis of an unsupported assertion that "it would have been obvious to one of ordinary skill in the art" to modify Hentschke's teaching to reach the claimed invention.

Claim 112 recites a communication system, including a receiver, a transmitter, and a TMDS-like communication link (including at least one conductor pair) between the transmitter and the receiver. At least one of the transmitter and the receiver is configured to transmit a differential signal to the other of the transmitter and the receiver over the conductor pair, and said at least one of the transmitter and the receiver is configured to transmit a signal indicative of auxiliary data to the other of the transmitter and the receiver over the conductor pair by common mode modulation of said conductor pair. There is no teaching or suggestion determinable from Hentschke (at page 1, line 16 – 52, or elsewhere) of a transmitter and receiver configured as recited in claim 112. The Office Action does not even include a contention that Hentschke teaches or suggests a transmitter configured to transmit a differential signal over a conductor pair, and a receiver configured to transmit a signal indicative of auxiliary data to the transmitter over the conductor pair by common mode modulation of said conductor pair (or a receiver configured to transmit a differential signal over a conductor pair, and a transmitter configured to transmit a signal indicative of auxiliary data to the receiver over the conductor pair by common mode modulation of said conductor pair). Absent such teaching or suggestion determinable from Hentschke (or other art of record), Applicants respectfully contend that it is improper to reject claim 112 on the basis of

an unsupported assertion that "it would have been obvious to one of ordinary skill in the art" to modify Hentschke's teaching to reach the claimed invention.

Claims 7, 22, and 50 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hentschke in view of U.S. Application 2003/0210821 ("Yogeshwar"). In response, Applicants contend that these claims are patentable over the cited references for the following reasons. Claims 1 and 18 (and thus claims 7 and 22) are patentable over Hentschke for the reasons set forth above. Yogeshwar fails to teach or suggest any of the above-noted limitations of claim 1 or 18 that Hentschke fails to teach or suggest. Thus, Claims 1 and 18 (and claims 7 and 22) are patentable over Hentschke and Yogeshwar, considered individually or in combination.

Claim 48 recites a communication system, including a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the link comprises at least two video channels, the transmitter is operable in a first mode in which it transmits video data to the receiver over a first subset of the video channels but not a second subset of the video channels, the transmitter is operable in another mode in which it transmits video data to the receiver over all of the video channels, and the transmitter is configured to transmit auxiliary data to the receiver over the second subset of the video channels during the first mode.

There is no teaching or suggestion determinable from Hentschke and Yogeshwar that any link between a transmitter and a receiver should include at least two video channels as recited in claim 48, or that a transmitter should be operable in the modes recited in claim 48. The Office Action does not identify any link between elements of Hentschke's or Yogeshwar's system that includes at least two video channels, or any element of Hentschke's or Yogeshwar's system that is operable in the modes recited in claim 48. Thus, claim 48 (and claim 50 which depends therefrom) are patentable over Hentschke and Yogeshwar, considered individually or in combination.

Claims 31, 32, and 35 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hentschke in view of U.S. Application 2003/0014755 ("Williams"). In response,

Applicants contend that these claims are patentable over the cited references for the following reasons.

Claim 31 recites a communication system, including a transmitter, a receiver, and a TMDS-like communication link between the transmitter and the receiver, wherein the transmitter is configured to transmit video data over the link to the receiver "as a stream of binary data words that determine an analog auxiliary signal as well as the video data." Claim 35 recites a transmitter including circuitry configured for generating (and asserting for transmission) an output signal indicative of a stream of binary data words that determine an analog auxiliary signal as well as video data, wherein the analog auxiliary signal is indicative of the auxiliary data.

An example of the noted transmission of binary data words is set forth in the specification at page 50, where it is explained how analog audio signals (or other analog auxiliary signals) can be transmitted in accordance with the invention in DC disparity channels of a TMDS-like link: "In each DC disparity channel, as the accumulated DC disparity changes, the maximum allowed DC disparity value (beyond which the DC disparity channel cannot be used) can be dynamically changed, so that the envelope of the DC disparity wander can itself be considered an analog signal indicative of the auxiliary information to be transmitted (e.g., an analog audio signal which can be amplified at the receiver side and then used to drive a loudspeaker)."

Williams fails to teach or suggest transmission of a stream of binary data words that determine an analog auxiliary signal and as well as video data, at cited paragraph #0003 (as suggested in the Office Action) or elsewhere. At paragraph #0003, Williams apparently teaches transmission of digital video, digital audio, and digital auxiliary data (of which the digital video and digital audio data can be converted to analog signals in a receiver after transmission); not transmission of a stream of binary data words that determine an analog auxiliary signal and video data, as claimed. Hentschke also fails to teach or suggest transmission of a stream of binary data words that determine an analog auxiliary signal and video data, as claimed).

There is no teaching or suggestion determinable from Hentschke or Williams of a transmitter configured to transmit a stream of binary data words that determine video data and an analog auxiliary signal, as expressly recited in claim 31 or 35. The Office Action does not identify any element of Hentschke's or Williams' system that is configured as recited in claim 31 or 35. Thus, claim 31 (and claim 32 which depends therefrom) and claim 35 are patentable over Hentschke and Williams, considered individually or in combination.

Claims 82, 84, and 94 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hentschke in view of U.S. 5,944,281 ("Pittman"), and claims 83, 85, and 92 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hentschke and Pittman, in view of Yogeshwar. In response, these claims are canceled.

Claim 91 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Pittman, and claim 93 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Hentschke, Pittman, and Yogeshwar, in view of U.S. Patent Application 2002/0019984 ("Rakib"). In response, these claims are canceled.

Claim 41 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Piccirillo in view of Yogeshwar. In response, Applicants contend that this claim is patentable over the cited references for the following reasons.

Claim 36 (from which claim 41 depends) recites a receiver, a transmitter, and a TMDS-like communication link between the transmitter and the receiver, wherein the transmitter is configured to transmit video data over the link to the receiver, the link includes at least one multi-purpose line, the transmitter and the receiver are operable in a first mode in which one of the transmitter and the receiver transmits a first signal indicative of auxiliary data over the at least one multi-purpose line to the other one of the transmitter and the receiver, and the transmitter and the receiver are operable in a second mode in which one of the transmitter and the receiver transmits a second signal over the at least one multi-purpose line to the other one of the transmitter and the receiver.

For the reasons set forth above, claim 36 is patentable over Piccirillo. Like Piccirillo, Yogeshwar fails to teach or suggest a transmitter and a receiver operable in a first mode in which one of them sends a first signal indicative of auxiliary data over at least one multi-purpose line to the other one and in a second mode in which one of them transmits a second signal over the at least one multi-purpose line to the other one, as recited in claim 36. Thus, claim 36 (and each claim depending directly or indirectly therefrom) is patentable over Piccirillo and Yogeshwar, considered individually or in combination.

Claims 52 and 56 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 6,801,575 ("Crinon"). As indicated above, these claims are hereby canceled.

Claim 59 stands rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Application 2002/0102097 ("Kobayashi"). In response, Applicants contend that this claim is patentable over the cited reference for the following reasons.

Claim 59 is directed to a transmitter is configured to transmit video data and auxiliary data to the receiver over a channel (e.g., a video channel) a TMDS-like communication link, where the video data are determined by a first set of code words, the auxiliary data are determined by a second set of code words, and none of the code words in the second set is a member of the first set, and to a communication system including such a transmitter. Claim 59 is patentable over Kobayashi because Kobayashi fails to teach or suggest (at the cited passages or elsewhere) a transmitter configured to transmit video data (determined by a first set of code words) and auxiliary data (determined by a second set of code words) over a video channel (or other channel) of a communication link, where none of the code words in the second set is a member of the first set.

The Office Action indicates that claims 23, 28-29, 42, 51, 63-65, 94, 100, 106, 110-112, 116, 118, 120, 122-124, 130, 132, and 142 would be allowable if amended to overcome the rejection under 35 U.S.C. 112. The uncanceled ones of these claims as amended are believed to be in condition for allowance.

The Office Action indicates that claims 9, 13-14, 24-27, 30, 33, 34, 37-40, 44-45, 49, 53-55, 58, 62, 66, 67, 70-73, 77-78, 80-81, 86-88, 93, 97-98, 102-105, 107-109, 113-115, 117, 119, 121, 126-129, 131, 133-141, and 143 would be allowable if rewritten in independent form and amended to overcome the rejection under 35 U.S.C. 112. For the reasons set forth herein as to patentability of claims from which these claims depend, the uncanceled ones of these claims as amended are believed to be in condition for allowance.

Respectfully submitted,

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